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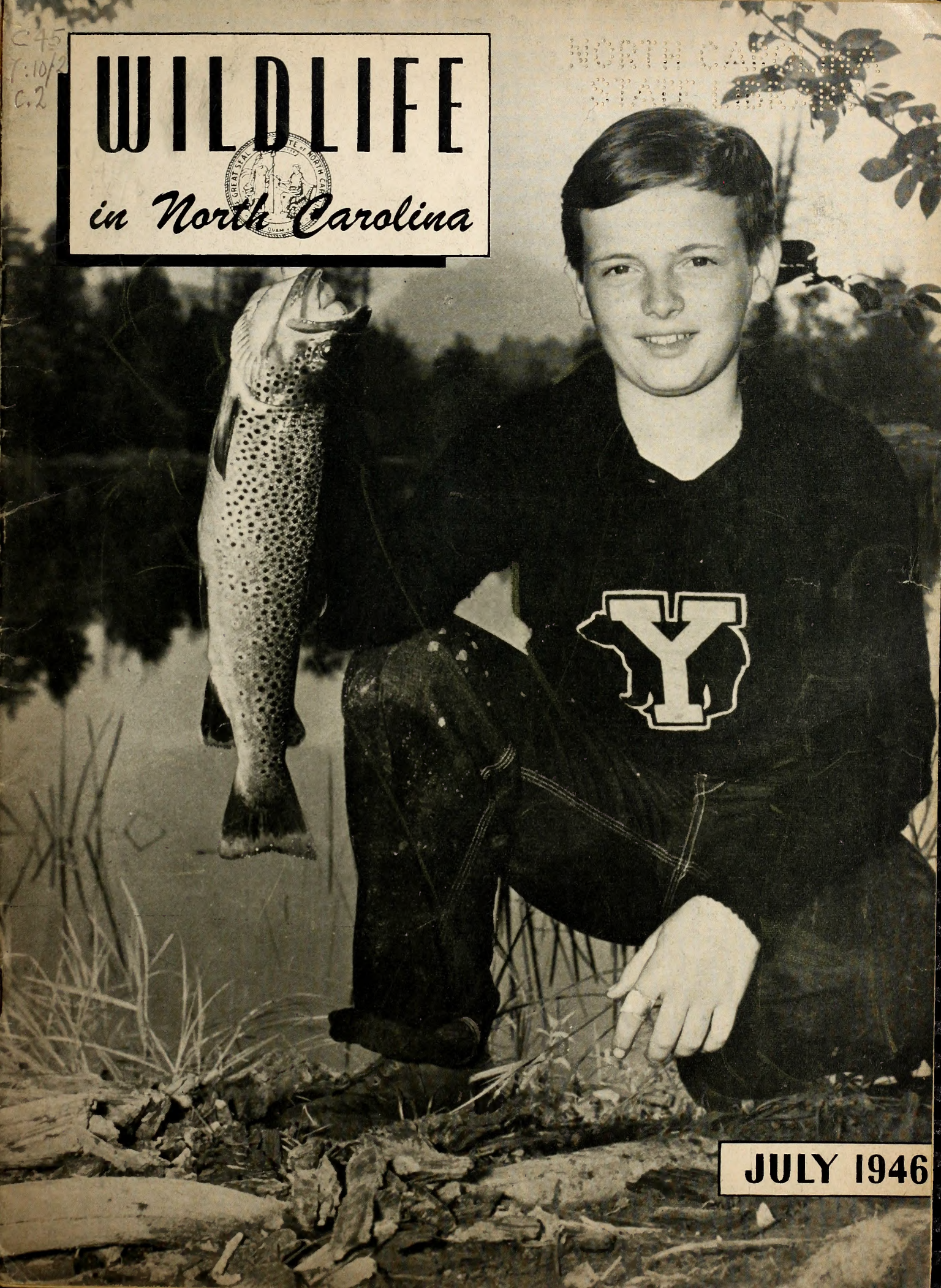
WILDLIFE
in North Carolina



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THE COMMISSIONER'S COMMENTS

Recognizing the importance of protection in a game and fish management program this Division has been exerting every effort toward improving and expanding the work in this field. Major emphasis has been placed on the work of the Game and Fish Protectors and I would like to call to your attention an article in this month's magazine on the subject of law enforcement.

No law enforcement agency is particularly proud to show an increased number of violations of the law and the number of arrests is not always indicative of the efficiency of an organization. On the other hand, figures on the number of arrests and convictions during the past several months do show that the game and fish protectors in North Carolina have been active. There has been a constant improvement in their work as they become more and more familiar with the new organizational work plan. I am proud to point to this record and to tell you that these men are working day and night in the interest of the hunters, fishermen and trappers.

We have by no means reached the efficiency in our law enforcement work we are striving to attain, but we are making progress.

In calling this to the attention of the readers of this magazine, I would like to point out again that the game and fish protectors are working in the interest of the law abiding hunters, fishermen and trappers in North Carolina. Their's is a difficult and sometimes thankless task. They need your help and active assistance in the carrying out of their duties and in the apprehending of law violators. After all, they are working toward providing more and better hunting and fishing and trapping for you. In helping them, you are helping yourself.

J. D. FINDLAY

WILDLIFE IN NORTH CAROLINA

A quarterly magazine devoted to the protection and restoration of our wildlife resources and to the improvement of hunting and fishing in North Carolina.

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Department of Conservation and Development

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JOHN D. FINDLAY, *Commissioner*

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Chief of Law Enforcement

DR. WILLIS KING
Fisheries Biologist

DENNIS HART, Acting
Federal-Aid Coordinator

DENNIS HART
Game Biologist

T. H. WALKER
Educational Supervisor

R. B. ARMFIELD
Mgt. Areas and Refuges

LINDSAY B. HOPKINS
Division Engineer

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GENE WIKE AND T. H. WALKER
Co-editors

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THE POLLUTION PROBLEM

Fish and Wildlife Service seeking solution to pollution problem in nation's waters; experiments established to determine minimal standards of water purity.

Fish killed by Pollution

THE introduction into water of any material which results in the injury to aquatic life or jeopardy to the health of consumers of the water, comprises pollution. We have much too much of this in the waters of North Carolina.

The principal sources of pollution in North Carolina streams are sewage, pulp mills, textile mills, saw mills, soil erosion and other industries and activities that cause waste to find its way into streams in abnormal quantities.

W. A. Schleicher, Kentucky chemist, says oxygen deficiency in the streams probably causes the death of more fish and more often interferes with growth and reproductive functions than any single factor. The energy and activity of all animal life depend on the conversion of solid and liquid food by the digestive system into a form proper to react with gases supplied by the respiratory system.

Not unlike man in this respect, fish require oxygen to carry on their life processes. They pump water through their gills. Oxygen diffuses through the gill membrane into the blood stream and is transported throughout the fish as it is needed. The U. S. Bureau of Fisheries says water must contain a minimum of about 5 parts per million of oxygen in order for a mixed population of fish to exist in a state of health.

Game fish, more active and fast moving than others, require more oxygen. For them the more nearly the water reaches oxygen saturation, the better. Catfish, carp and certain other sluggish fish, which have adapted themselves to lower stratas of water, can thrive in lower oxygen content. However, low oxygen content of water interferes with the growth and reproduction of catfish and serious oxygen depletion causes the death of all types of fish.

Reporting on the menace of pollution, the Secretary of the Interior rendered views expressed by the Director of the U. S. Fish and Wildlife Service in which he said:

"The effect on animal resources has been so wastefully destructive that pollution is now one of the most serious and complex of conservation problems occupying the attention of the Fish and Wildlife Service.

The Service has for the past 10 years carried on a series of experiments in various parts of the country to establish minimal standards of water purity necessary for the support of aquatic life. This information is required as a basis for effective control measures. It has been established that streams pollutants, regardless of their source, can be grouped into three classes: those which disturb the balance and general conditions of nature required to maintain aquatic life, those which have toxic action on fish or other aquatic forms and those which combine both hazards.

The first group included various effluents, both municipal and industrial, which reduce the dissolved oxygen, alter the acid-alkali balance of water, increase

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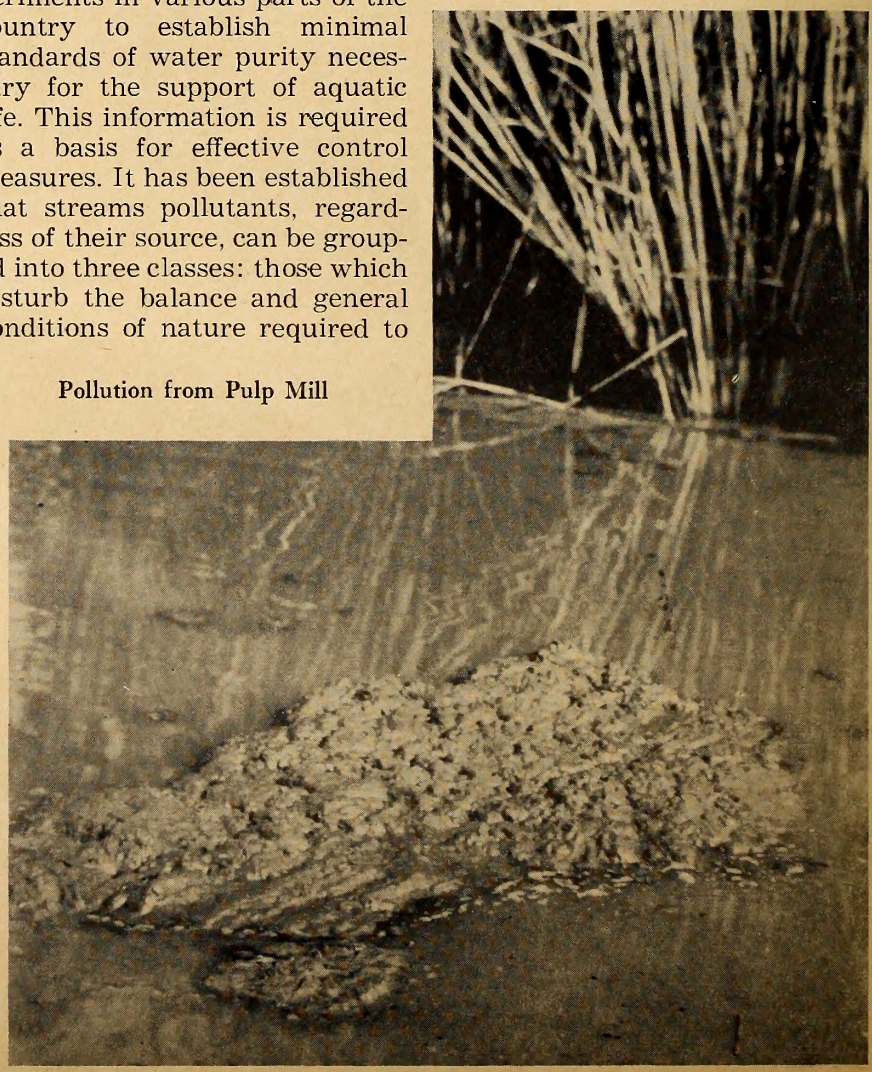


Pollution from Pulp Mill

USE DDT in fields and forests cautiously. The U. S. Fish and Wildlife Service says damage to various kinds of animal life, especially to commercially valuable resources such as fish and crabs, is likely to be widespread and severe unless the spraying of the insecticide is restricted to the lowest concentration useful in insect control.

Based on preliminary field investigation in Maryland and Pennsylvania, and on a smaller scale in ten other states and Canada, scientists pronounced mortality among wildlife from the use of more than two pounds of DDT per acre was high, and they said that mortality was slight where lower concentrations were used. Fishes, crabs, and frogs appeared more seriously affected by DDT than birds and animals. The effect of repeated applications, required for the control of mosquitoes and some field and orchard insects, is not known.

In a section of the Patuxent River in Maryland where spraying was conducted, dead fish drifted into nets stretched across the streams for four days, although the heaviest mortality took place during the first 48 hours. In a pond treated with DDT at 1 pound per acre, 80 per cent of bluegills, 93 per cent of the red-bellied sunfish, and 78 per cent of yellow perch were killed. In one pond, the application of only one tenth pound per acre resulted in loss of 43 per cent of the fish.

In one spraying of the shores and shallow waters of Island Beach, New Jersey, 150 dead or dying crabs were found in 200-yard stretch ten days after the application. This concentration was only one-half pound per acre.

Experimenting with its effect on birds, a census of breeding birds was taken on two tracts of forest land before and after the areas were treated with DDT oil spray. Within 48 hours, a concentration of five pounds to the acre, the bird population was much reduced. In areas with one pound per acre, little effect on the bird population was apparent.

Field observations on the damage to fish and wildlife caused by DDT used in insect control were made in 12 states and the Province of Ontario. Fair to successful insect control was effected.

The principal investigations were made on forest lands in Maryland treated experimentally to determine the effects of DDT on vertebrates and invertebrates, and in Pennsylvania where gypsy moth larvae were the objects of control.

Application of DDT was made chiefly as an oil spray by airplane. Spray concentrations ranged from one-fifth pound to 5 pounds per acre. The greatest quantity used anywhere was an application to the ground of dry DDT at the rate of 25 pounds per acre.

USE DDT

with

CAUTION

The amount of DDT that actually reached the vegetation showed considerable local variations from the specified rate of application, owing to bad weather, lack of landmarks, defective spray apparatus, and difference in density of vegetation.

Pronounced mortality in wildlife resulted from the use of most of the higher concentrations of DDT. Mortality was slight from the lower dosages, those sufficient effectively to control the insect pests concerned. Invertebrates, fishes and other cold-blooded vertebrates were more readily affected than were birds and mammals.

In the single trial made, DDT was much more toxic to fish when applied in emulsion than when applied in oil or in suspension.

In laboratory experiments, cottontail rabbits were not affected by single doses of crystalline DDT at levels less than 1,500 milligrams per kilogram of body weight. For quail, no effect was produced below the 200 milligram level. The DDT was more toxic when dissolved in oil.

Fish were usually killed by single doses of DDT as low as 5 milligrams per kilogram of body weight, especially if dissolved in oil. In oils of low melting point, the toxicity was increased.

No effect was obtained by feeding to bluegills and sunfish, flies sprayed with DDT in oil at the rate of one pound per acre.

Controlled spraying of an entire habitat, including food, at the rate of 5 pounds of DDT per acre had no effect on field mice.

Minimizing Danger

Use DDT for the control of an insect pest only after weighing the value of such control against the harm that will be done to beneficial forms of life. Wherever more than a small area is involved, consult county agricultural agents, State or Federal entomologists, wildlife and fishery biologists, and United States Public Health Service officials.

Use one-fifth pound or less of DDT per acre in an oil solution to avoid damage to fishes, crabs, or crayfishes, use less than 2 pounds per acre to avoid damage to birds, amphibians, and mammals in forest areas. Because of its greater effectiveness, use smaller quantities of DDT in emulsions.

Use DDT only where it is needed. Wherever it is applied by airplane, provide careful plane-to-ground control to insure even coverage and to prevent local overdosage.

In forest-pest control, wherever feasible, leave strips untreated at the first application to serve as undisturbed sanctuaries for wildlife, treating these strips at a later time or in succeeding seasons if necessary.

Wherever DDT is used, make careful before and after observations of mammals, birds, fishes, and other wildlife.

The Slippery Eel

HOLD YOUR WRATH, LADIES, THEY MAY BE GOOD TO EAT

By Bill Sharpe

LADY, don't glare at your husband when he returns laden from that spring fishing trip! The strange-looking stuff he brings home with him may be delicious to eat—better than anything you can get at the local market.

Housewives have been throwing away lord knows how many tons of game fish every year rather than dress and prepare it. Much of it is precisely the fish for which they pay good money at the market—perhaps under another name. And there is hardly a fish in the water which is not considered delicious by someone somewhere—people who survive and thrive on their diet. This year, as never before, housewives are going to scrutinize more closely and less dolorously the offerings of their Waltonian husbands.

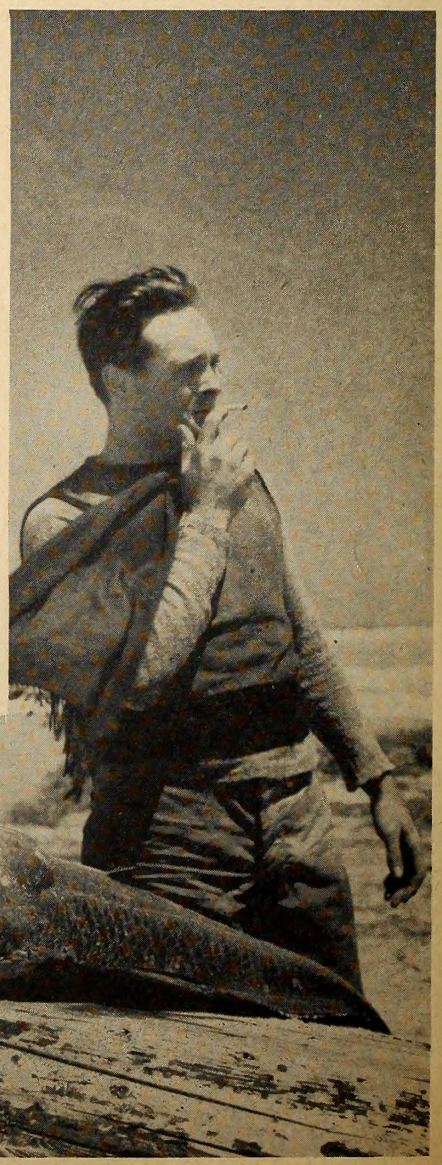
Let us take, for instance, the pigfish, caught frequently by sportsmen in North Carolina, and all too often tossed back or cut up for bait. Actually, the pigfish locally is called "sailor's choice" a tribute to its worth as a panfish. Then there's the dreaded barracuda, caught, photographed and dumped overboard, though rated "delicious" by some cooks.

Prejudice against a fish's appearance, his habits, or superstitions concerning him, have caused untold economic loss to American fishermen. The ugly toadfish (oysterfish) which has a disposition so mean that he will jump out of the water to snap at you with his powerful jaws, makes a tasty seafood tidbit, but few persons knowingly eat him.

Such prejudices have been broken down in the past, and even more rapidly are disappearing under the exigencies of food shortages. It's a good deal for mankind too, because the sportsman's family may learn to be a

How The Tar Heels Cook 'Em

Species	*Cooking*
Channel Bass	Bake, broil, fry
Striped bass	Bake, broil, fry
Bluefish	Bake, broil, fry
Carp	Bake, broil, fry
Catfish	Bake, fry
Clams	Fry, steam
Crabs, alive	Boil (Hard shell)
Meat	Fry, broil (Soft shell)
Eel	Broil, boil, fry
Flounder	Bake, broil, fry
Herring	Bake, broil, boil, fry
Lobster, alive	Boil, broil, bake
Meat	
Mackerel	Bake, broil, boil, fry
Mullet	Bake, broil, fry
Oysters	Bake, broil, fry
Perch	Bake, broil, fry
Pickerel	Bake, broil, boil, fry
Pike	Bake, broil, fry
Shad	Bake, broil, boil, fry
Sheephead	Bake, broil, boil, fry
Shrimp	Boil
Trout	Bake, broil, boil, fry
Tuna	Bake, broil, boil
Weakfish	Bake, broil, boil, fry
Amberjack & dolphin	Bake, or fillet
Barracuda	Boil with vegetables
Crappie	Fry
Small & Large-mouthed bass	Broil, bake, fry
Muskelunge	Bake, broil, or fillet



The Channel Bass of Coastal Waters

little more tolerant of their tired and fish-laden hero.

Don't judge your sportsman-husband's fish necessarily by its size. Tiny fish caught in Carolina make a good fried fish; and the largest red drum (channel bass) are good in stews. As a general rule, cooks fry (deep fat or pan fry) small fish and small fillets; broil medium-sized fish, bake (sometimes stuff) the larger fish. But you can vary this with innumerable recipes. Don't overcook any fish, and remember that the nice fresh fish your hubby brought home directly from the fishing trip is probably a lot tastier than anything you buy at the market.

REVISED PROCEDURE FOR DISTRIBUTING FISH

At a meeting of the Board of Conservation and Development May 13, 1946, a change was made in the policy to be followed in distributing fish produced at State Hatcheries. This change in policy was necessitated by the increasing demand for fish to stock privately owned or controlled waters. This demand has exceeded the capacity of our hatcheries and an equitable distribution of fish has become difficult.

Public Waters. First priority will be given to publicly owned or leased waters which are open to all anglers under State regulations. This includes streams and lakes on National Forests, National Parks, and State owned or leased waters. Whenever possible investigation and recommendation by a qualified aquatic biologist will precede stocking. Application forms are not required for stocking public waters.

Semi-Public Waters. Consideration will be given requests for fish to stock waters which are owned or controlled in part privately, but which are open to public fishing without a fee. An approved application may be required before fish are released in such waters.

Privately Controlled Waters. All those who are interested in obtaining fish for stocking private streams and ponds should endeavor to obtain them from the U. S. Fish and Wildlife Service. The Regional office which serves this State is at Atlanta, Georgia. The State will assist the applicant in obtaining the stock from a Federal Hatchery whenever possible.

The Division is authorized to release fish to stock private ponds or streams only after the needs of public waters have been met, and fish remain as surplus at the State Hatcheries. In this event fish will be released to persons having an approved application and upon the payment of their cost, based on an approved schedule of prices. Applications will be received and kept on file as in the past, and applicants will be notified when fish can be released to them.

Schedule of Prices. The prices charged for fish are in accord with the cost of producing them. The following prices will be in effect until further notice:

Black Bass (largemouth or smallmouth)		
	1 inch fingerlings	$ 2.00 per hundred
	2-3 inch fingerlings	5.00 per hundred
	large fingerlings	10.00 per hundred
Bluegills and other sunfishes		
	2-3 inch fingerlings	2.00 per hundred
	large fingerlings	5.00 per hundred
Trout		
	1-2 inch fingerlings	2.00 per hundred
	3-4 inch fingerlings	5.00 per hundred
	5-6 inch fingerlings	10.00 per hundred

Payment must be made to the Hatchery Superintendent upon delivery of the fish. A signed receipt should be obtained. All monies received from the sale of surplus hatchery fish will be credited to the fisheries fund and used to further the program.

In planning the allotment of fish from the various hatcheries, any fish of legal size which are available for distribution will be placed in waters open to public fishing. Only fish of fingerling size will be allotted to private applicants. It will be necessary for applicants to call at the hatcheries to obtain the fish allotted them.

Requests for additional information and correspondence relative to obtaining fish from the State should be addressed to the Division of Game and Inland Fisheries, Raleigh, N. C.

The Pollution Problem

(Continued from page 4)

turbidity and reduce light penetration, blanket the bottom with unproductive materials, or otherwise modify general stream conditions. The second and third groups may be considered together because of the common hazard of toxicity to living things. In these groups are various metallic poisons, acids, dyes, organic compounds and sulfur derivates, noxious gases, such as chlorine and methane, and compounds like cyanides which enter the streams as by products or wastes from numerous types of industrial activities.

It is extremely difficult to establish national standards of water purity necessary to safeguard aquatic resources. Experiments conducted by the Fish and Wildlife Service over many years have demonstrated that even the lethal limits of many specifically poisonous substances cannot be defined. This is because slight changes in the acidity or salt content of water, the dissolved oxygen, and the natural ability of water to neutralize acids, will materially alter the toxicity of many compounds. Copper sulfate, for example, was found to be toxic to most fish and aquatic animals in the water of one stream even when diluted with 4 million parts of pure water, while in another stream a concentration four times as great was readily tolerated by the same species because of differences in the amounts of other dissolved salts carried by the two streams.

Instead of being subject to uniform Nation-wide standards of water purity which government and industry could apply confidently, each stream or river basin presents individual problems which must be studied on the ground. Pollution abatement practices must be developed for each particular situation if our aquatic resources are to be protected.

Thus pollution is controllable only on local and State levels. At the same time, it is a national problem and it is the duty of the National Government to furnish guidance for the abatement of this nuisance. During the past year, the Fish and Wildlife Service has compiled the results of its long study on this subject in a bulletin entitled, "The Determination of Water Quality." This work, now in press, is designed to serve as a guide to those engaged in pollution control.

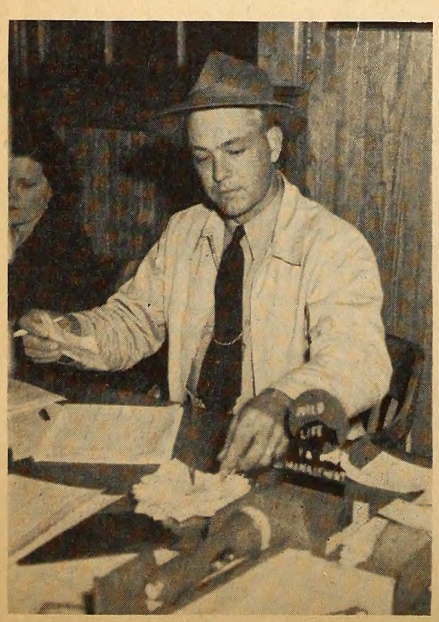
BEATING THE BUSHES

THEY'RE beating the bushes—the fish and game protectors. Records speak, and the score of prosecutions has made a continuous climb, the highest for a single month totaling four hundred and eighty convictions for fish and game violations.

We're hot on the lawbreaker's trail, says Chief C. D. Kirkpatrick, as he works his division leaders and deputy protectors around the clock in order to clear the woods, lakes and streams of violators.

Prime duties of the protector include his friendly visits to farmers and his explanation of how they can plant food and cover, leave hedge-rows and in general cultivate wildlife along with their other crops; his daily patrols through the woods and up and down the streams in search of violators and illegal fishing equipment; his search for predators such as wild dogs, cats, and other animals that prey upon wildlife; his distribution and handling of the licenses for the Division; his civic duties in respect to educational work with the people in his locality, and his regular reports to the North Carolina Division on how the State can best serve the sportsmen in the area. His job is never done, but his work is measured by the scope of the activities he engages in and the result of his toils with each. He is a crusader for the restoration of wildlife.

Tom Rollins, Asheville, newly appointed Division Supervisor



One yardstick to put against the protector's work is the record of violations he puts an end to, and Chief Kirkpatrick's men can show a mark that speaks well for their vigilance and diligence. In the first six months of this year, they obtained a total of 1,805 convictions; fines paid during this period totaled $8,903.01, and payment of court costs $11,135.50.

In an effort to procure the highest type of leadership in the field, the North Carolina Division of Game and Inland Fisheries is striving for increased pay and better working conditions among the men on the job. Salaries and travel allowances have been raised until the beginning aspirant receives at least $160 a month, and promotion in the field is the common aim of the law enforcement organization.

This is evidenced by the recent assignment of Tom Rollins of Asheville as Division Leader for Western North Carolina. Rollins had been working the Piedmont area, where he had manifested an unusual interest and ability in the work. His alertness in his new assignment brought his division the leadership in the field of prosecutions during the month of May and has kept his men near the top on every report.

Newest in the scheme of protectors' activities is the raiding system devised to apprehend illegal hunters and fishermen. It's a plan whereby district and de-

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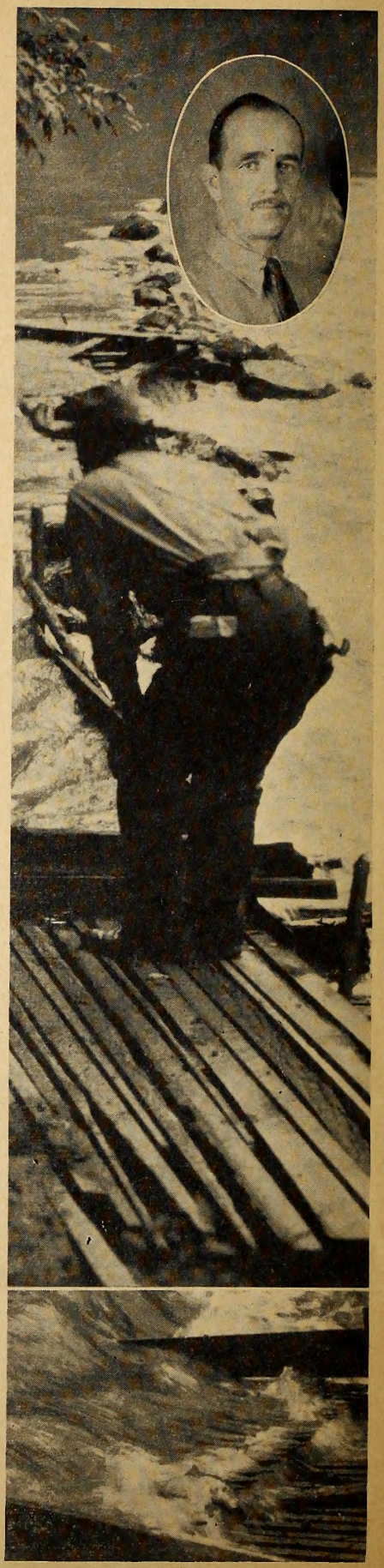
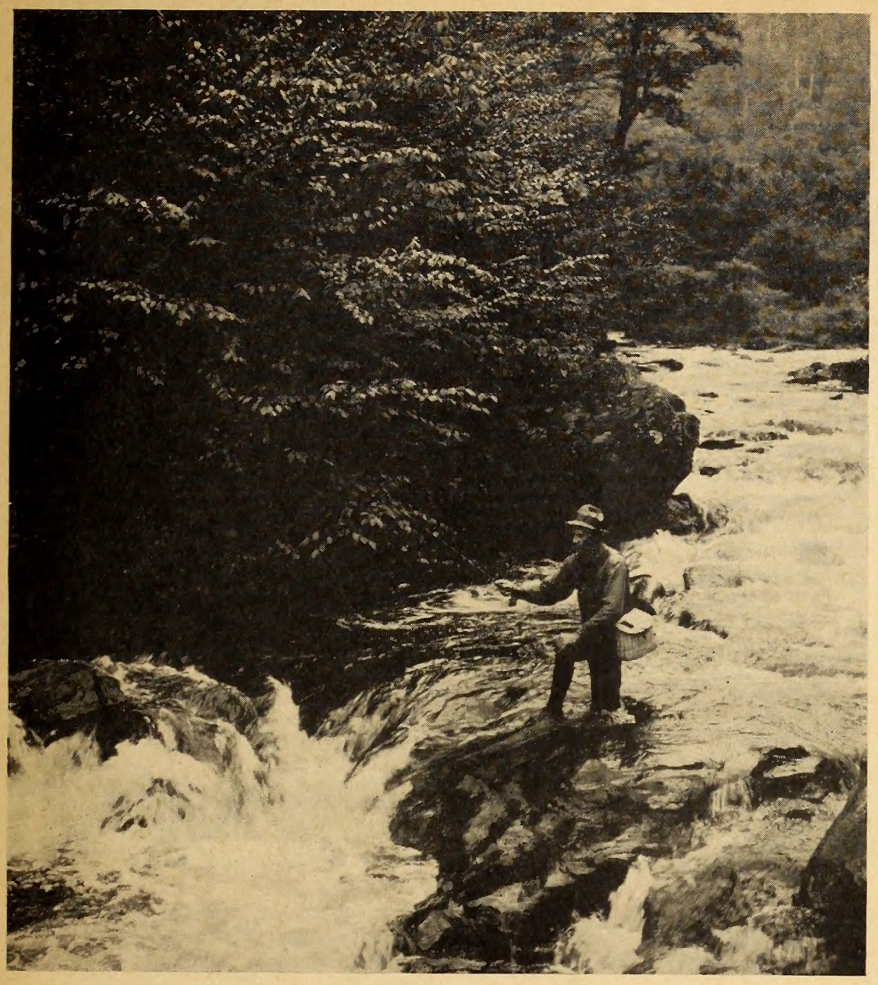


This fish trap, destroyed by Robert F. Logan (inset), Division Supervisor, and his corps of game protectors on Third Creek, was 30 feet long by four feet wide and 18 inches deep, constructed in two sections to hold a large poundage of fish.



Going After Trout in the Smokies

SEASONS IN NATIONAL PARK

THE superintendent of the Smoky Mountain Park, Blair Ross, has announced open and closed fishing season in the national park for 1946. Main streams are open to fishing; all tributaries are closed.

North Carolina Division

Big Creek below Gunter Fork
- Swallow Fork below McGinty Creek

Cataloochee Creek below Palmer Creek
- Rough Fork below end of truck trail
- Caldwell Fork below McKee Branch

Oconaluftee River below Wild Cherry Branch
- Bradley Fork below Chasteen Creek
- Straight Fork below Ledge Creek
- Raven Fork below Cherokee Reservation

Deep Creek below the Forks
- Left Fork below Hermit Branch
- Indian Creek below Georges Branch

Forney Creek below Jonas Creek
- Bear Creek below Poplar Flats

Twentymile Creek below Forks
- Right Fork below end of truck trail
- Left Fork below end of truck trail

Open Season

Trout—May 16 to August 31, inclusive.

Rock bass and smallmouth bass—June 16 to August 31, inclusive except that Little River below Sinks Bridge and Abrams Creek below Abrams Falls are closed to all fishing until June 16.

There is no open season on other species of fish.

Night fishing is prohibited and fishing permitted only between sunrise and sunset.

Restriction as to use of bait: Fishing is permitted only with artificial lure with but one hook.

Size Limits: Rainbow and brook trout under 7 inches in length, rock bass under 6 inches in length, and smallmouth bass under 11 inches in length shall not be retained unless injured in catching.

Limit of Catch: The maximum catch in any one day, and the maximum number of fish in possession shall be ten fish of any or all species, except that the limit for small mouth bass is 5 fish per day or in possession.

Fishing License: The park as such makes no charge for fishing license, but persons fishing in waters therein must have the state or county license issued and required by North Carolina, or the state license required and issued by Tennessee, depending upon the division of the park being fished.

North Carolina Fishing License Provisions and Fees: County resident annual—$1.10; state resident annual—$3.10; state resident daily permit—$0.60; non-resident daily permit—$1.10; non-resident five-day permit—$2.60; County licenses are required in Swain and Haywood Counties for residents of these counties who wish to fish within the bounds of their resident counties only, and no state license is required for them. Any persons (including women) over 16 years of age fishing out of resident county are required to purchase a state license or a daily permit. North Carolina licenses can be obtained from the following: Any County Court Clerk or State Game Warden; Rangers and Wardens located at the Big Creek, Cataloochee, Deep Creek, Forney Creek, Hazel Creek, and Twentymile Ranger Stations, as well as at Connor's store at Smokemont, North Carolina.

DANIEL BOONE REFUGE AREA

By R. B. Armfield

IN the corners of Avery, Burke and Caldwell counties, there is an area of about 46,000 acres containing some of the best game lands and trout streams in North Carolina. It is the Daniel Boone Wildlife Management Area, and the land belongs to the U. S. Forest Service. It is managed for wildlife under cooperative agreement between the Forest Service and the N. C. Division of Game and Inland Fisheries.

Good For Deer and Bear

Because of its location, which is somewhat removed from the more frequented main thoroughfare, this area is not so well-known as Pisgah Game Preserve or the Mt. Mitchell Wildlife Area. It is, however, considered as being the equal or possibly even better than some other mountain areas for growing deer and bear and mountain trout. The area borders the Linville Gorge, which is one of the rougher sections of western North Carolina, and other parts of the area are just as wild.

Cooperative Management

The Daniel Boone Area has been under cooperative management since 1930, and at that time 110 deer from Pisgah and Burleson Deer Park were released. Since then the deer and bear on the area have been closely protected and the deer herd is now estimated to number more than 600 animals. Bear are plentiful, especially in the Linville Gorge section.

Fish Good

Trout fishing on Daniel Boone is good. In 1945 a total of 1021 fishermen visited the area and caught 6164 fish. The average length of the fish was 8 inches, and brown, rainbow, and brook trout were taken.

Streams Restocked

To keep fishing at its best for the sportsmen, the State restocks

these streams each year. This year 3,700 trout have already been planted in North and South Harpers, Rockhouse, Lost Cave and Gragg Creeks, and the many other streams on the area. An additional planting will be made in midsummer of at least an equal number of fish.

Protection Important

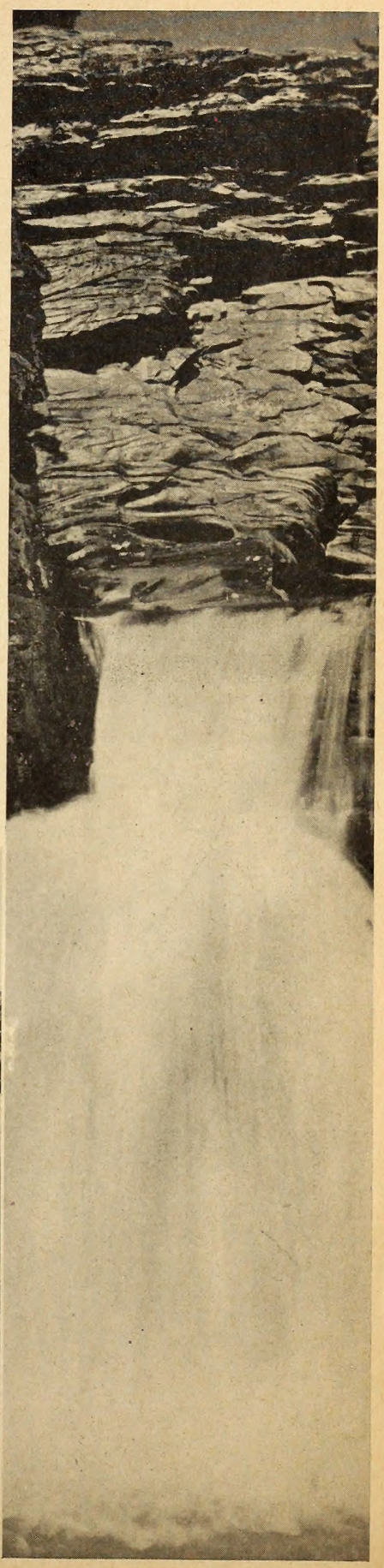
With big game, such as deer and bear, the important problem on Daniel Boone is protection from poachers and dogs. The Division of Game and Inland Fisheries has a Refuge Manager and two Refuge Rangers stationed on the area whose duties are to carry out the protection. It is not an easy job. The area is rough and the roads are few. Most patrol work is done on foot.

Management Personnel

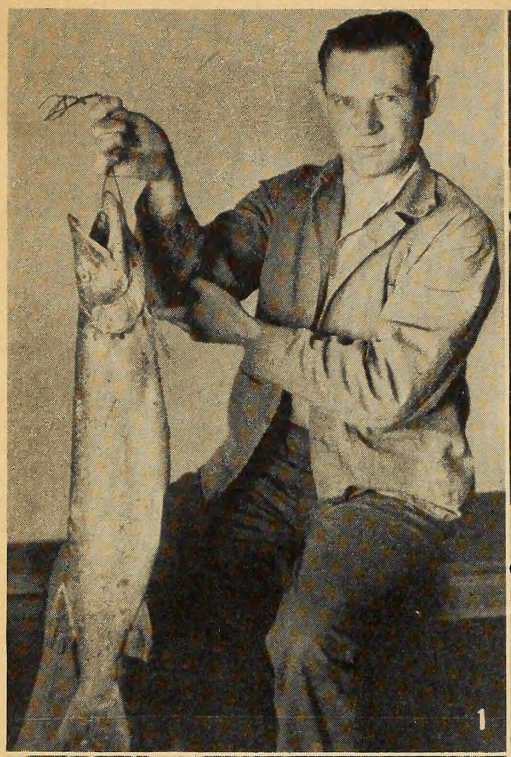
W. M. Pritchard, who lives at Fox Camp Ranger Station on Highway No. 181, is the Refuge Manager and he is ably assisted by Ranger Steve Clark, who lives at Edgemont, and Ranger Carl Wiesman, who lives at Kawana Ranger Station. These men are all real out-doorsmen, and they will be only too glad to assist visitors in becoming acquainted with the area.

Smallmouth Bass Hatchery

Bordering the refuge is Table Rock Mountain, near which is the site of the State's new smallmouth bass hatchery now under construction. This hatchery will consist of a five-acre feeder lake, twenty-four rearing pools, and housing facilities sufficient for the administrative personnel and equipment. With ten men operating a bull-dozer tractor, five trucks, and associate equipment, Lindsay B. Hopkins, Division Engineer, reported the dredging of Irish Creek completed and the excavation complete for pouring concrete for the dam. Its purpose is to provide smallmouth bass for stocking the whole of western North Carolina.



The Daniel Boone Refuge is both rugged and picturesque. Some of the most scenic spots are on or border the management area. Pictured at left are Linville Caverns and Table Rock, and at right Linville Gorge and Linville Falls.



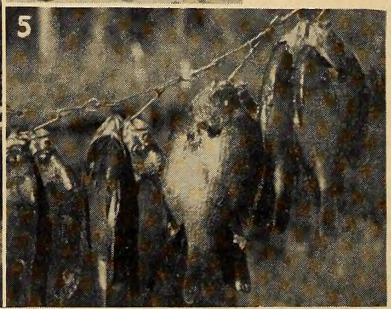
CAUGHT IN NOR

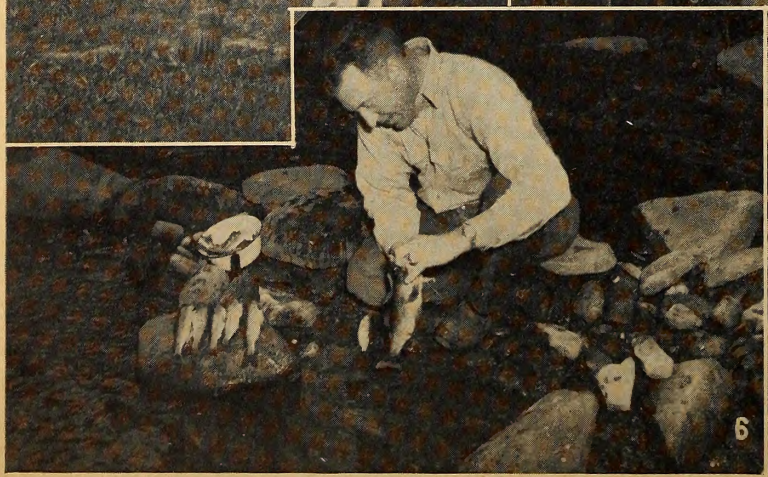
Inland

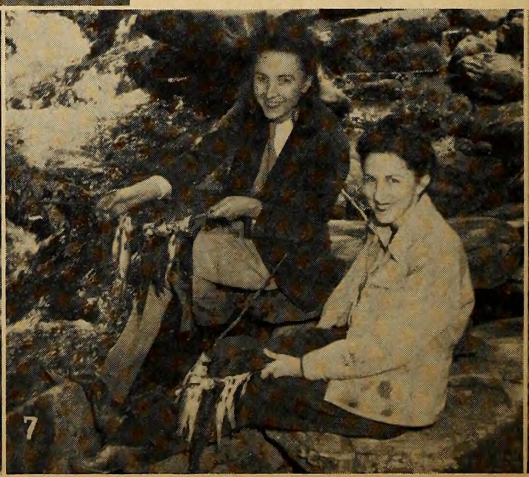
Whether you tussle the taut line with th tro North Carolina or tackle the sea bass in is h say that the Tar Heel variety presents m e fi other state. Maybe, but the fact is that N rth assorted shapes and sizes of game fish v eth few that were taken from North Carolin wa

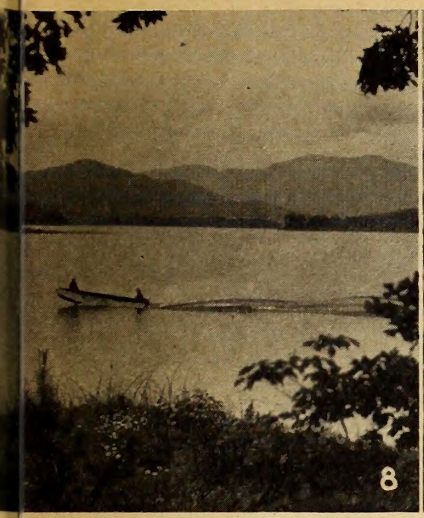
Inland: (1) muskallunge—few still ound Little Tennessee; (2) black ass; large-mouthed bass from the iedm string; (6) and (7) brook and inbo streams; (8) putting out for th day' of the mountain region.

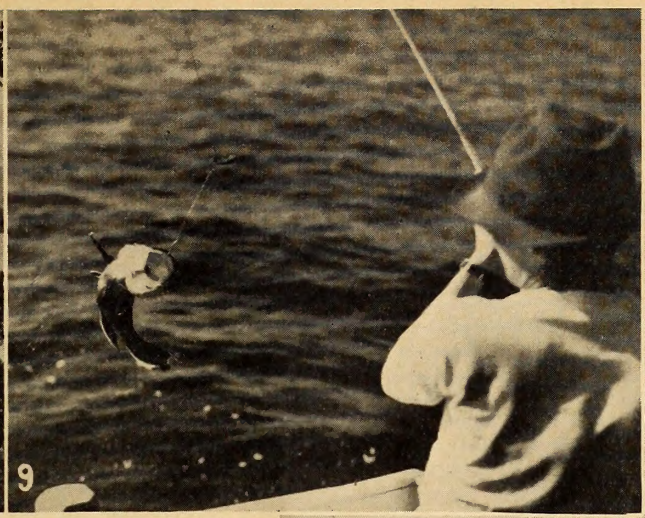
Coastal: (9) sea-bass; (10) han rockfish or striped bass; (12) ting fishing (14) sheephead and (1 lan

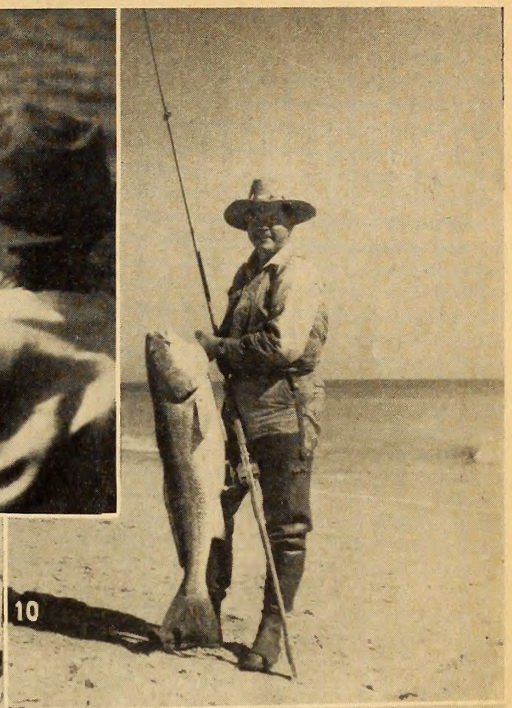












RTH CAROLINA

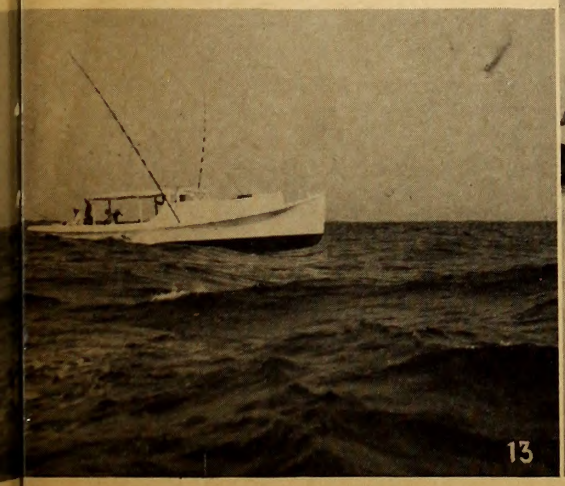
Coastal

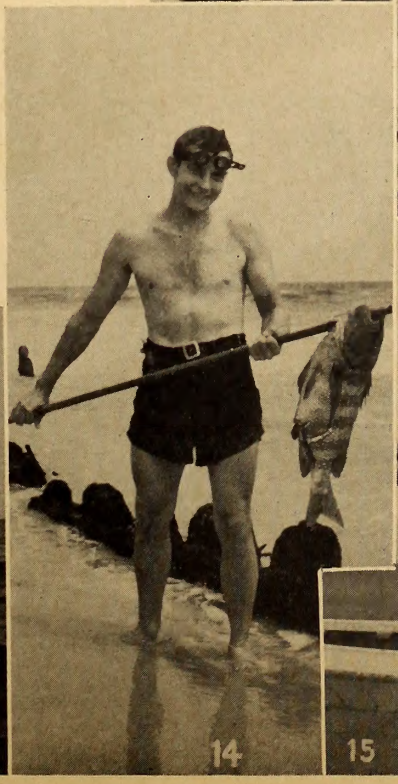
trout in the mountain waters of western is haunts along the seashore, fishermen e fight per pound than the species of any rth Carolina is blessed with species of ether coastal or inland. Here you see a waters.

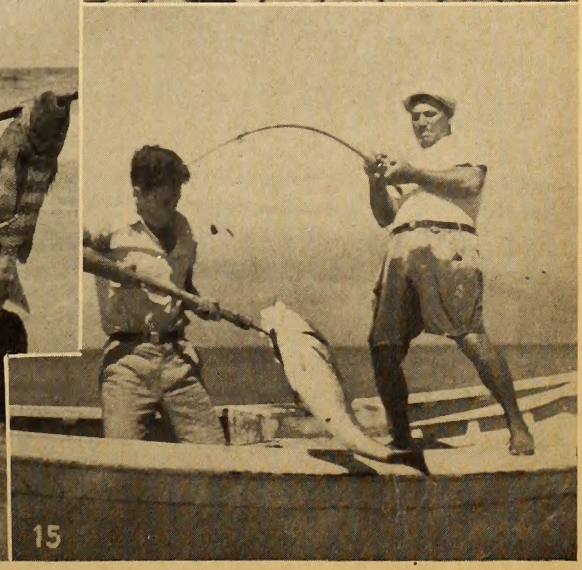
und in South French Broad River and ss; (3) the blue-catfish; (4) edmont; (5) blue-gill on the inbow trout from the mountain day's fishing in one of the lakes

nannel bass or red drum; (11) ingaree; (13) going deep sea landing another channel bass.

Photos courtesy of State News Bureau







WILDLIFE INVESTIGATION

By William L. Hamnett
Project Leader

THE main objective of the wildlife management program of the North Carolina Division of Game and Inland Fisheries always has been to restore to the field, streams, and forests of North Carolina, through the development of habitat and game restocking, a portion of that abundant animal life which once was found throughout our State.

In looking back over the work of previous years it is apparent that we have encountered a number of delays, handicaps, and failures in our attempts to restore wildlife in North Carolina. It is the opinion of the writer that these limiting factors which caused a delay or failure must be investigated and then modified if found practical to do so.

The first step toward our goal is accurately to determine the distribution of our game birds and animals and the habitat conditions which prevail for the environs.

It is with this purpose in mind that the Division of Game and Inland Fisheries is beginning a STATE - WIDE INVESTIGATION OF WILDLIFE HABITAT AND DISTRIBUTION as the first step which will have the following objectives. (1) A complete account of the distribution of game birds and animals throughout the State. (2) The distribution of habitats with emphasis on abundance of food and cover available. (3) The correlation of agriculture and industrial development as an effect upon the present wildlife distribution. (4) A county report, for each county of the State, of its wildlife resources with recommendation for correction or change if necessary. (5) A published report of the Wildlife Resources of North Carolina.

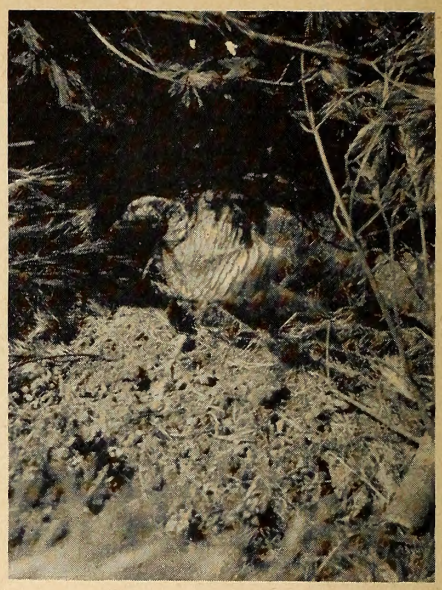
It is felt that many other questions and answers will be developed throughout the course of the investigation, and all of this is proposed to be presented to the general public of our State.

Three field biologists will be employed to carry out the field work, one in each of the three geographical regions of the State: Mountain, Piedmont, Coastal Plain. A draftsman will be employed in the Raleigh office to prepare county maps, showing the wooded areas and cultivated areas, for the use of the field men.

On the county base map, scale 1 inch to 1 mile, will be transposed the aerial photograph data collected by the A.A.A. in the recent flights flown in North Carolina. This will show in outline the relationship of wooded areas to cultivated lands. The field men will take this map to the field and put in the type of woodland that predominated in each locality. He also will record the understory and ground vegetation of wildlife interest throughout the area. The map will then be returned to the Raleigh office for its final preparation. It is the first time a State-wide mapping program of this type has ever been attempted in this region. These cover maps will be available for our current plans and advancements in wildlife management in North Carolina and should be of unlimited value to other organizations in the State.

The field men are to have a plan to follow so they may go about their assigned work in a systematic and orderly fashion.

On entering a county the game protector, county agent, and forest rangers will be contacted and their aid solicited in the wildlife survey. Local governmental agencies in allied work will be called upon to furnish pertinent information.



Wild Turkey — One Species Under Investigation

Our greatest source of information will be from the people who harbor the wildlife on their land. And also from the local wildlife conservation organizations and key sportsmen of the community.

The field men will spend a greater part of his time going over areas of the county to avaluate the habitat and study the relative distribution of game birds and animals.

At each contact prepared forms will be filled out to show the game birds and animals present; the vegetation type; water bodies; food and cover; deer, turkey, and quail records; and track counts. It is expected that the field men while working in your county will compile enough forms to indicate the status of wildlife in the county. With these forms and his observations will be prepared the final report.

You are the hunter, the sportsman, and the benefactor of your wildlife resources and it is through you and your cooperation that the writer can secure adequate information for this fundamental approach to our goal: to present to the people of North Carolina a true and unbiased accounting of your wildlife resoures.

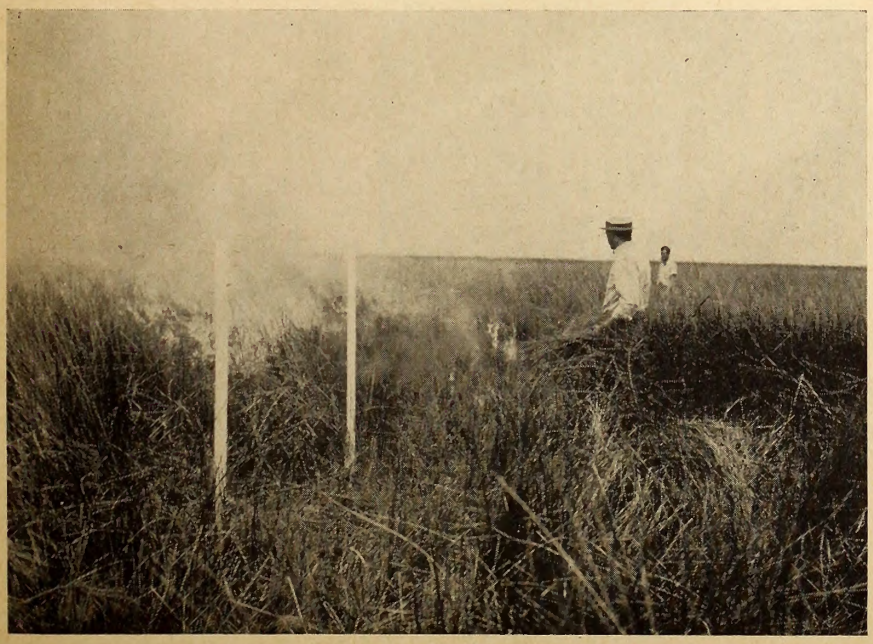
FUR-RESOURCE INVESTIGATION

THE investigation of the fur-bearing animals of North Carolina has been resumed after a three-year interval because of the war. This project's work is now chiefly concerned with the important muskrat - producing coastal marshes, but will later include all sections of the State. The main object is to provide factual information for the proper administration and management of the fur-bearers of North Carolina, thereby increasing the annual income from this source, which is estimated to be about one million dollars annually.

This summer a survey is being made on the coastal marshes to determine plant types, muskrat distribution, and possible areas for experimental development for muskrat. The most productive muskrat marshes of North Carolina are located in the northeastern counties. There are 33,600 acres of marshland in Camden and Currituck Counties alone. Although much of this area is highly productive, with proper management the yield should be greatly increased. However, most of the marshland in North Carolina is of little importance for muskrat production. For example, Carteret County has approximately 57,000 acres of non-productive marshland. This project will carry on experimental practices to determine the most economical methods of increasing the productiveness of marshland now producing muskrats, and making non-productive land suitable for muskrat production. An attempt will be made to use equipment that is easily available, preferably farming equipment. In some of the salt marshes, it would be mandatory to control the water level and increase the freshness of the water by diking, which would call for heavier equipment. The experiments will include various methods of plowing, mowing, burning, plantings by seed and rootstalks, water level control, and eradication of undesirable plants by chemical agents.

The present marsh management practices and existing habitat conditions on certain areas in Currituck County will be determined and evaluated. Present water level control methods, marsh burning practices, trapping and marketing procedures, and the extent of predation and controls now practiced, will be observed and evaluated. Breeding data and weights and measurements of muskrats trapped on specific areas will be obtained to determine population composition. An effort will be made to develop census methods applicable to use by marsh owners as an aid in the formulation of management plans. Live-trapping and banding investigations will be made on selected areas to determine the range requirements and best methods of transplanting muskrats to non-productive marshes.

Beaver were re-introduced into the State before the war and have increased in numbers sufficiently to warrant transplanting them into other areas within the State. A survey will be made of the present beaver distribution in the sandhill area in Richmond County, and where they are in sufficient numbers, they will be transplanted to new localities.



Joe Rabb, Project Leader, supervising controlled burning in region of fur-resource investigation

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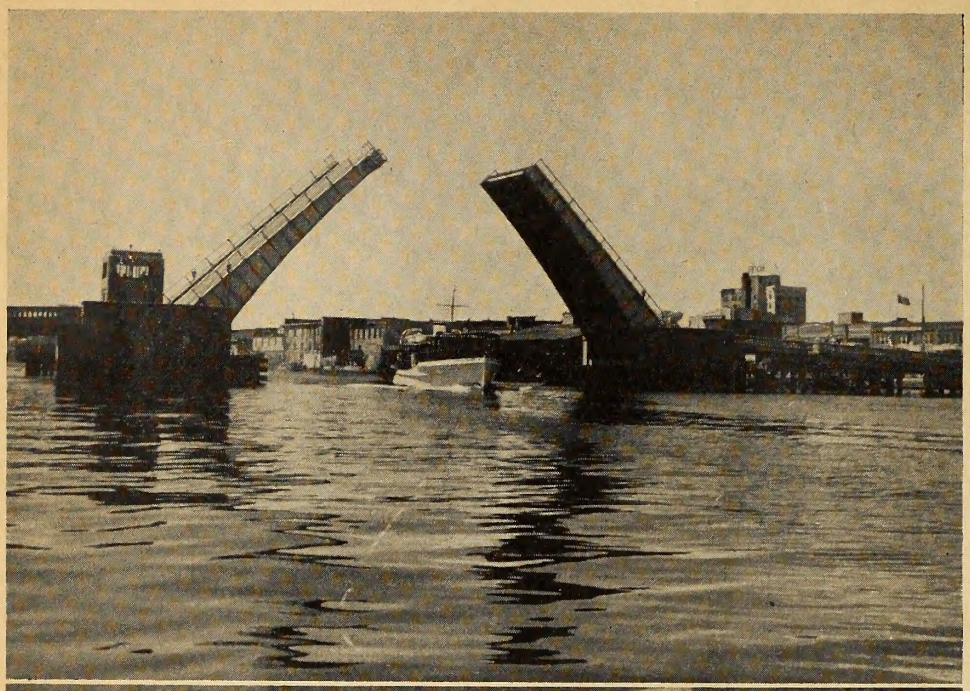
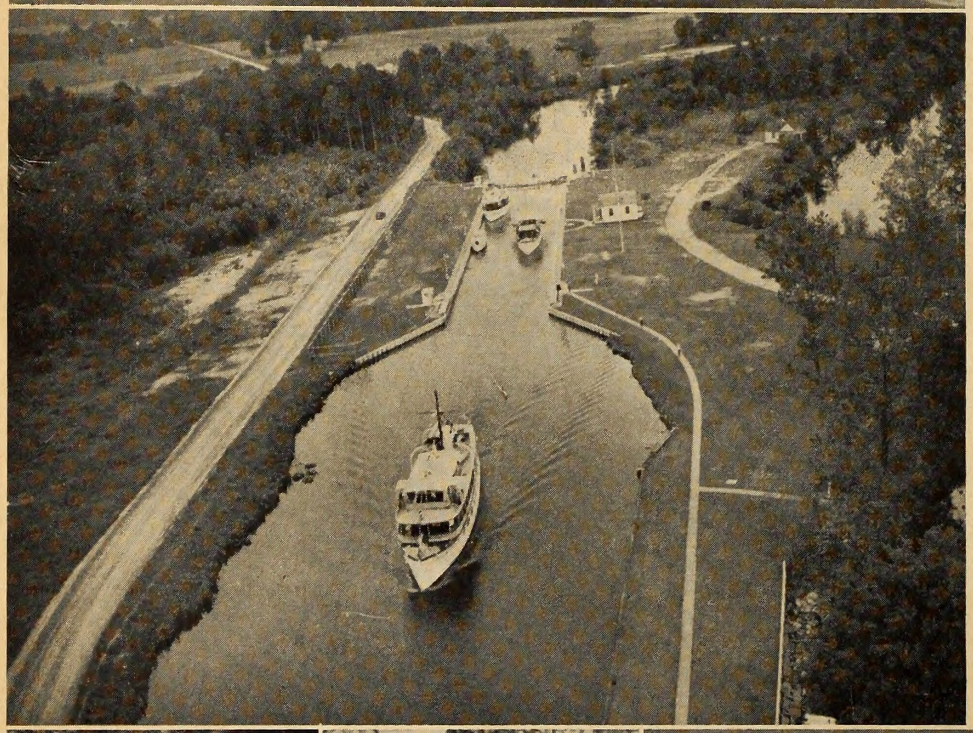
Bulletin On Mammals

The North Carolina Division of Game and Inland Fisheries has on hand for mailing an unlimited supply of the following bulletins: The Mammals of North Carolina, The Norris Lake Fishing Experiment, Wildlife Crop on Your Farm, and the Uwharrie Deer Project. For copies write to the North Carolina Division of Game and Inland Fisheries, Education Building, Raleigh, N. C.

CORNELL PARTY IN STATE

Dr. Edward C. Rainey, assistant professor of zoology at Cornell University, and two Cornell graduate students were in eastern North Carolina for a few days in June to collect fishes for scientific study. Dr. Rainey is an authority on the fishes of the Atlantic Seaboard and has been in the State several times previously.





THE GREAT DISMAL SWAMP

NORTH CAROLINA sportsmen are elated that George Washington's Ditch —the Great Dismal Swamp Canal—is shortly to be restored to its standard nine-foot channel depth. This is the report from Army Engineers, and thus our oldest man-made waterway will carry sportsmen into better fishing and to a section where bear and deer abound in creditable numbers.

At one time, it is said, game was so numerous in the Dismal Swamp that some hunters killed as high as thirty bear in a single year. Occasionally sportsmen from Virginia drift down into these badlands to pick off a deer. Birds that nest on the ground are scarce, but the canal and tributaries make the good fishing at Lake Drummond accessible.

Indicative of good bear hunting, seven of the eight winners in the championship bear contest sponsored by Virginia sportsmen were taken from the Dismal Swamp. Steve Heretick of Hopewell, Va. took first prize with his kill in the Swamp which measured twenty-eight and three-

quarter inches circumference of the head at the large point of the jaw and presented an eighty-one and three-eighths inches hide length. Perhaps some North Carolinians did as well.

With the re-opening of the canal to traffic and sportsmen, there is a possibility that North Carolina sportsmen will join with Virginia and Pennsylvania in a tri-state deer and bear championship contest. At least this is what George B. Johnson, Chairman of the Virginia Deer and Bear Contest Committee, has in mind. Johnson resides at 60 Hopkins Street, Hilton Village Branch, Newport News, Va., and has surveyed hunting and fishing prospects in both North Carolina and Virginia side of the swamp.

Furthermore the Boards of Conservation and Development of Virginia and North Carolina are looking inquiringly towards acquisition of the Great Dismal Swamp as a national forest. Both states have given en-

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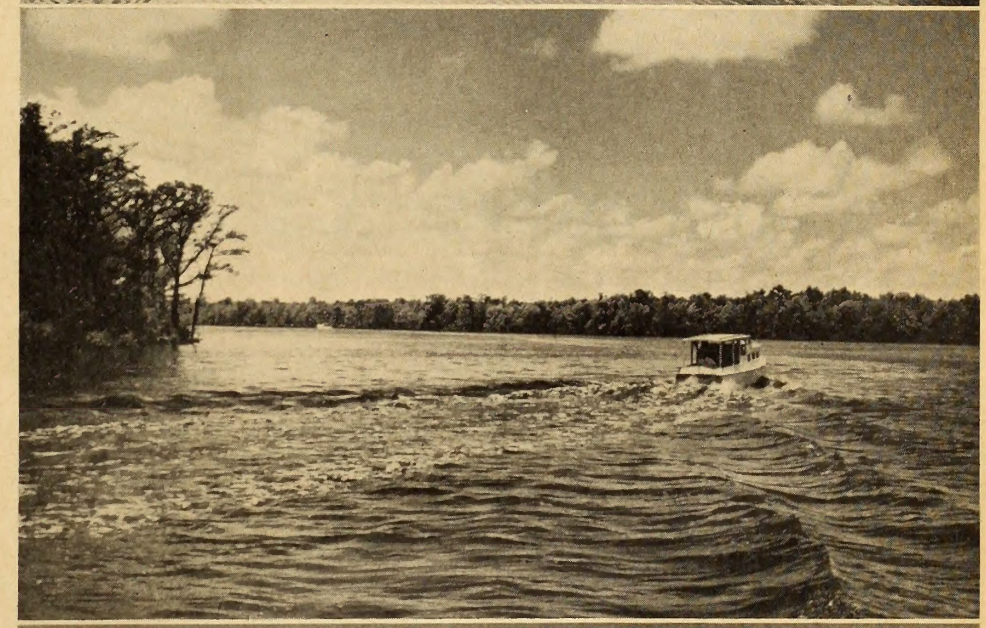
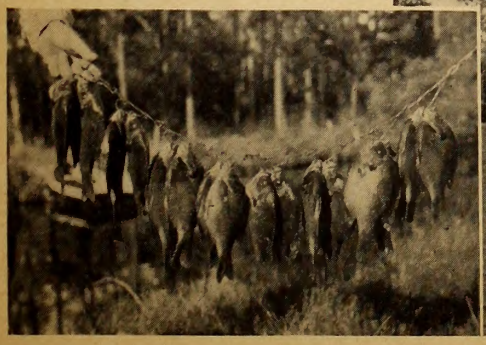
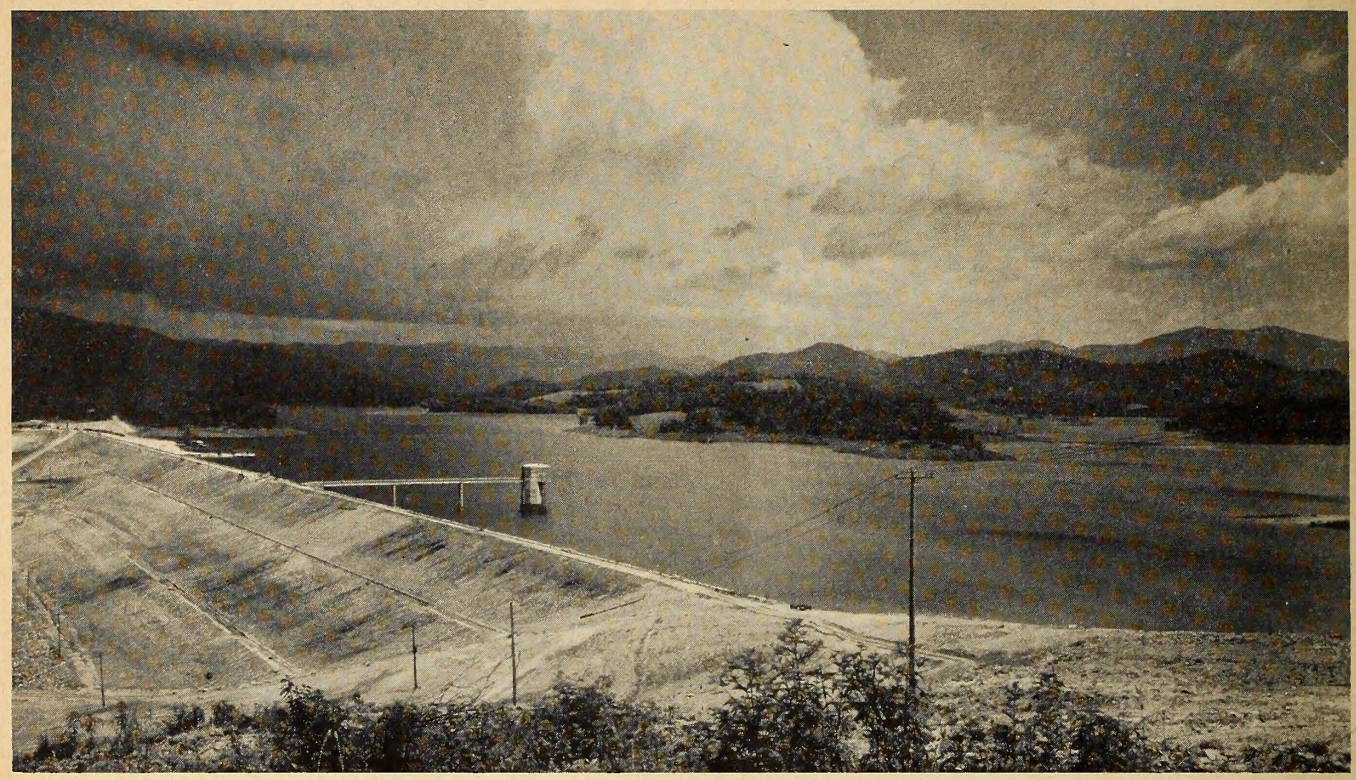




The Great Dismal Swamp Canal —Top left — under the highway bridge at Elizabeth City, N. C. Center left—One of the two locks. Bottom left— Deer, bear, muskrat, bass, and blue-gills—wildlife species of the swamp. Top right—Feeder ditch which taps Lake Drummond; Center right — The canal goes through forbidding swamp. Lower right—Blackbeard's house on the Pasquotank is one of the historic markers

MORE ABOUT YEAR-ROUND FISHING



TVA's Chatuge Dam on the Hiwassee River is 140 feet high and 2,850 feet long. The lake is 12 miles long and has a surface of 7,050 acres

By Willis King

ONE of the most widely discussed subjects in angling circles is the matter of year-round fishing. What is meant is not that one must fish every day, every week, or even every month of the year, much as he might like to, but that the closed season be abolished. Angling then becomes a pastime indulged in when the fever strikes, and when the weather is good enough to permit the enjoyment of a day spent on a lake, stream or pond.

The opinion seems to be current that removing the restrictions on fishing during the spring spawning season was an idea born as a result of research on certain TVA lakes. Rather, the idea is not even young, and in North Carolina has enjoyed a husky existence even in public waters for over a decade. In privately owned ponds this State has never imposed a closed season. Many private ponds have continued to afford satisfactory fishing to their owners, others never were any good, and if the absence of a no fishing period had anything to do with the poor fishing, it has never been demonstrated.

While we are on the subject of fishing in relatively small ponds, experiments at the Agricultural Experiment Station at Auburn, Alabama, showed that rarely over 50 percent of the fish population of a pond can be taken by pole and line. When the population of a pond is reduced to a point somewhere near this figure, the fish quit biting. This is explained by the simple fact that there is now more food available, and the angler's offering does not produce the same reaction as it does when many mouths are eagerly searching for their next meal. When the population again catches up with the food supply, the angler's bait takes on new attractions. To go to other examples, no closed season has been imposed on sport fishing on the waters of Currituck Sound, Kitty Hawk Bay, Northwest River, and Lake Mattamuskeet for several years. If the opinion of commercial fishermen in the Currituck Sound country can be accepted, the catch of largemouthed bass by pole and line methods has been a very small part of the bass population. To have imposed a closed season would have accomplished nothing in this heavily fish populated Sound. At Lake Mattamuskeet, the situation has been somewhat different. After Lake Mattamuskeet was reimpounded in 1932, largemouthed bass were reintroduced and became exceedingly abundant.

The condition did not last, and the bass have been replaced by white perch, black crappie, and unfortunately carp. The change in population is in the writer's opinion due to a change in environment, and is to be expected. However, catch records indicate that the bass population is again increasing.

Worth mentioning is the fact

(Continued on page 20)

WHAT'S A SPORTSMAN?

By David A. Aylward
(National Wildlife Federation)

IT can be said with a pretty fair degree of justice that nowadays the sportsman who is not an active member of a conservation organization shouldn't really consider himself a sportsman at all.

Let's go back a ways . . . .

Thoreau, the gentle philosopher of Walden Pond, sets forth in his writings that he came to study and to love the outdoors as a boy through his ardor for hunting. It was with gun and dog that John Burroughs first discovered the world of wildlife which he so eagerly explored during a long lifetime. Theodore Roosevelt, who first proclaimed the basic need of conservation in this country, was an enthusiastic hunter.

Sportsman's Delight

All of us who confess to a fondness for a bird-dog in action, who thrill to the roar of wings or to the singing of a reel sometimes are called upon to explain to mystified women-folk and other well-wishers just how we justify our primitive enjoyments and our determination that wildlife must be protected, conserved, restored.

I guess we can't explain. The true sportsman's kinship with the outdoors is mysterious. His love for living creatures increases as he becomes older, and it is entirely likely that he may at some stage lay aside the rod and gun for the camera, the note-book, or merely for the pleasures of roaming and observing.

Nearly three-quarters of a century ago sportsmen, alarmed by the inroads being made into wildlife resources, got together, ate dinners, listened to speeches, smoked cigars, passed resolutions, demanded legislation—and went home to forget about the whole business.

Later on, other sections of the public got excited. Some cried out for the complete prohibition of all shooting for sport. They disregarded the fact that the short-sighted reclamation projects have obliterated far more ducks than the pump gun, far more fur than the trapper. That pollution has destroyed more fish than all the nets and dynamite and spears ever manufactured. That "clean farming" and overgrazing and fires have done far more harm to upland game—as well as to insectivorous birds—than all the shooters, trappers, hounds and ferrets.

Modern conservation did not begin with the enactment of laws, with closed seasons and bag limits. Nor with ambitious hatching and planting programs. Certainly not with "predator control," regarded with increasing skepticism by all practical game management authorities.

It began when sportsmen got together, not only for annual dinners, but for concerted action during 365 days a year.

It began when they comprehended that the restoration of environment is of first importance, not only to sport, but to our whole economic structure. Wildlife is the crop that is of first interest to the sportsman, but wildlife is only an extra dividend paid on the re-building of our productive system of earth, water, vegetation.

It began when sportsmen began to join hands with the women's organizations, with farmers, business men, and youth.

Beating the Bushes

(Continued from page 8)

puty protectors congregate for a definite campaign. Working in pairs, ten to twelve men make a clean sweep for illegal fishing and hunting, and they seldom miss.

Furthermore, the Division's district fish and game protectors work in conjunction with the refuge protectors on refuges and management areas. When a specific assignment calls for more men on the refuges and management areas, these protectors join up to comb the section. Likewise when the outside rangers need more attention, the refuge men team up with the district protectors. This cooperation is having its effect in better protection within and without the areas.

So, the North Carolina fish and game protectors prowl anywhere in the State, on private and posted lands, on the protected areas and club sites, and in any locality where there is work to be done. They're working in the interest of wildlife and for the sportsmen of the State, but, Chief Kirkpatrick says, their efforts alone are not sufficient to bring about the total protection necessary for the best interest of all concerned. Hence he has issued a plea for all farmers, sportsmen, and every friend of fish, fur, or feather to pitch in with the protectors.

Year-Round Fishing

(Continued from page 18)

that the waters of Eastern North Carolina which are classed as "Commercial Waters," have always been open to the taking of game fishes throughout the year. Many of these waters never have supported good populations of game fish; others have, but in either case it is difficult to see where the imposition of a closed season would have made any difference.

In 1944 and 1945, the importance of an open season on several warm-water species was shown by Dr. R. W. Eschmeyer of the TVA in his work entitled "The Norris Lake Fishing Experiment." His work deserves special consideration in treating this subject. It was estimated that in Norris Lake pole and line fishermen took only from 10 to 20 percent of the adult game fish present. The remainder died, either of a ripe old age, or fell the victims of natural enemies. This information was established by two methods. The first was by catching, tagging, and releasing as many fish as possible in a portion of the reservoir. The retake of these fish by anglers was carefully recorded. The percentage of tagged fish recorded could be closely determined, and a ratio established between the numbers of tagged and untagged fish in the reservoir. A second method involved the use of gill nets set at different depths and seasons. The numbers and kinds of fish caught were carefully recorded, and studied in relation to the fish taken by anglers when fishing was permitted throughout the year. Evidence from this source confirmed that from the tagging experiments and brought out additional information of value. The question had often been asked, "What will the effect of no closed season have on the fishing throughout the summer and autumn months?" Creel census data show that the summer catch of fish was no less following an open spring season than it was in years before when a closed season of two months was enforced. In fact, the average catch per trip in Norris Lake from June to October, 1944, was 2.3 fish weighing 2.1 pounds. In 1940, during the summer months the catch per trip was 1.2 fish weighing 2.0 pounds. Dr. Eschmeyer concludes, "It seems that the spring catch, representing twice the summer catch, was merely a 'bonus'—was over and above the normal take." No one objects to the extra sport, and during the war the extra food was highly welcome.

A few comments on the behavior of certain game fishes, particularly the black basses, are of direct relation to our problem. TVA fisheries workers have shown in this and other reports, that the spring season is the best time for sport fishing because the fish are near the surface of the water, and food is scarcest at this season. The proffered minnow, natural or artificial, is especially welcome. There is still some controversy whether bass will "bite" while they are spawning and whether they strike or bump an angler's lure. I shall not attempt to advise the world on this point, nor do I see that it is of primary importance. The reproductive potential of all fishes is so great and the status of a species in any habitat dependent on so many factors, that this one drops to the background.

In summer, fishing becomes poorer and poorer for bass as the season progresses. The reason advanced by most fisheries workers depends upon two factors. The first is that natural foods were more abundant and the fish were less interested in the angler's lure. The onset of poor fishing coincides pretty well with the appearance of young fish of the year in large numbers. The second is that the surface waters are becoming quite warm and the fish become scattered in the deeper levels below the thermocline. The above does not apply to the fishing for such species as bluegills and robin, which spawn later than bass, and which are readily taken from their spawning beds from May to July.

Autumn fishing is good in some waters, poor in others. The growth of forage fishes may have something to do with it, also the weather and water levels are factors. A late autumn and low water usually mean poor fishing. Water temperatures become uniform throughout all strata on deep lakes and reservoirs, and the fish are widely scattered. It is hard to locate them, and angling success is likely to be uncertain. In winter the fish are in deeper water, often congregated. They have lost their appetites and good catches are rare.

The above points to one conclusion, that the best fishing for bass and crappie particularly is during the spring months. This is when man gets the fishing fever the hardest. Those who have access to trout streams can work off some of their enthusiasm, but the warm-water angler has been forced to keep off the public waters and concentrate his attention upon the contents of his tackle box. If spring fishing can be allowed without endangering the pleasure or success of future fishing it is a god-send to the angler.

A look at what other states are doing is of interest. Eleven states have no closed season on black bass, 22 have none on pan-fishes, three have none on trout. The trend is toward year-round fishing at least on warm-water species.

The closed season on warm-water species has been established in almost every instance to protect the black basses during their spawning season. It often happens that in many streams and lakes, neither the large-mouthed nor the smallmouthed bass are the principal species taken by anglers. The closed season in those instances is working a hardship on anglers and doing little or no good to the streams or lakes. In some of these waters the season has reopened just as the dominant game species, such

(Continued on page 22)

GAME PROPOSALS BEING PRESENTED TO THE BOARD

Following recommendations during the January session of the Board of Conservation and Development in Raleigh, the North Carolina Division of Game and Inland Fisheries' proposals on hunting regulations for next season will require action during the meeting in Morehead City July 22, 23, 24.

Faced with the problem of maintaining adequate breeding stock of game animals in the face of an anticipated increase in hunting pressure, the Division's proposals for this coming year feature a curtailmen in kill through shorter seasons and bag limits on some game species. These proposals are as follows:

DEER—A 47-day deer season, October 14 through November 30, is recommended for the taking of buck deer in and east of the following counties: Northampton, Halifax, Martin, Pitt, Lenoir, Duplin, Sampson, Harnett, Lee, Moore, Hoke, and Robeson. All counties west of the counties listed above to be closed to deer hunting. The bag limit to be one buck deer per day and one per season.

QUAIL—A 45-day quail season, December 2 through January 15, with a daily bag limit of 8. No season bag limit. It is recommended that this season apply to the entire State and that all special regulations be rescinded.

TURKEY — A 20-day season is recommended, December 2, through December 21, with a bag limit of one per day and one per season.

RABBIT — A 55-day season, November 20 to January 15 is recommended, with a bag limit of 10 per day.

SQUIRREL — West — In and west of Alleghany, Wilkes, Columbus, Burke, and Rutherford counties, the recommended season is October 1 to January 1, with a bag limit of six per day. East—The recommended season is October 14 to January 15, bag limit of ten per day. This is east of the counties listed above.

GROUSE—Season, November 20 to January 1, bag limit two per day and 10 per season.

BEAR — West — In and west of Alleghany, Wilkes, Caldwell, Burke, and Rutherford counties, the season October 15 to January 1, with a bag limit 2 per day and 2 per season. East—Season October 1 to January 1, bag limit 2 per day and 2 per season.

WILD HOG — October 15 to January 1, bag limit 2 per day and 2 per season.

OPOSSUM and RACCOON—Same regulations as last year, October 15 to February 15 with gun or dogs.

MINK, MUSKRAT, OPOSSUM and RACCOON—Trapping—December 1 to February 15, except

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The Game Committee of the North Carolina Division of Game and Inland Fisheries. Left to right, front row: J. Wilbur Bunn of Raleigh; Commissioner John D. Findlay of Raleigh; and Robert W. Proctor of Marion. Standing, left to right: R. Floyd Crouse, Chairman, of Sparta; J. R. Wollett, deceased, of Littleton; K. Clyde Council of Wananish, and A. H. Guion of Charlotte. D. M. Stafford of Greensboro was absent when this picture was made. Eric Rodgers of Scotland Neck has been appointed to succeed Mr. Wollett

The Great Dismal Swamp

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dorsement, North Carolina with the stipulation that the lands shall be definitely delineated and that the fish and game resources remain in the charge of the State's fish and game commission.

Interest in this respect was brought to a head during the war when the federal government set up an emergency fund for forest fire control in this area. This was enacted after several large fires the smoke of which impeded air and sea navigation in the Norfolk area.

The canal connects the Elizabeth River in Virginia with Albemarle Sound in North Carolina. It is in use today, but in recent years it has had little engineering attention. Washington himself surveyed the canal in 1763 and later invested in a company which proposed to drain the Great Dismal Swamp in an ambitious land development scheme. The canal, dug by slave labor, was not navigable, however, until 1822. For many years thereafter it carried a brisk traffic in lumber, shingles and agricultural products.

The canal cuts through one of the most famous swamps in the world—one which has piqued the curiosity of men since they first came to its green edge and were repelled by its desolate defences. But now drainage has shrunk the swamp areas from 2,200 to 750 square miles, and the canal itself leads through much cultivated land.

Nevertheless the whole area presents an intriguing challenge to the would-be Columbus of our time.

Year-Round Fishing

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as the blue bream, (Lepomis macrochirus atropurpurescene) and robin (Lepomis solis) were starting to spawn. The take of these species from their spawning beds has been heavy. In some waters they have become seriously depleted, apparently through overfishing during their spawning season, when they are most readily taken. Other factors enter into the picture, no doubt. If a closed season is imposed or needed, it should protect the dominant species and the one which contributes the most to fishing in those waters. This Division is reconsidering its present closed season with this thought in mind.

It is usually accepted that a relatively short open season on trout is all that these fishes can stand. They are taken readily, and hatchery stocking is dependent upon to provide a good portion of the annual crop. The State's ability to rear and release legal length trout is naturally limited. Too, the interest in trout fishing seems to die with the season.

In 1946, all the large reservoirs of the State, most of the larger municipally owned lakes, the State lakes, and many of the large public ponds were open throughout the year. It is expected that this plan will be adopted as a permanent management measure, until evidence is presented that fish populations are being depleted to the point where future angling will suffer. As a result, you can plan your fishing trip pretty much at your convenience.

Game Proposals

(Continued from page 21)

in Bladen, Columbus, Duplin, Greene, Hoke, Pender, Robeson, Sampson, Wayne, Wilson counties January 1 through January 31. No trapping season in Graham and Haywood counties except for the protection of domestic fowl, livestock, or crops. In and west of Surry, Wilkes, Alexander, Catawba, and Cleveland counties it shall be unlawful to set steel traps except for muskrat and mink in the waters and along the streams in the cultivated lands along said streams.

Fires Creek Refuge Ranger Harley J. Martin displays bobcats taken from his area. They grow big in the mountains.

SINKING THE LEADER . . .

Every fly fisherman realizes the importance of a fully-submerged leader. Gut or nylon that floats on the surface, whether in wet or dry-fly angling, causes disturbing currents, and casts shadows which are plainly visible on the botton.

Several methods of sinking the leader are employed. An old favorite is common soap, a small piece of which the angler carries and rubs on his leader before warming up his fly rod for the serious business at hand. Soap works quite well, as do the various preparations on the market designed expressly for the purpose. Mud and fish slime are sometimes employed with fair results by the ingenious, though improvident angler. — *Texas Game & Fish.*

By bobbing his head in a certain way, the sea gulls show other gulls the direction of a school of fish. — *Texas Game & Fish.*

The barn owl, whose diet consists mainly of rats and mice, will eat its own weight in food in a single night.—*South Dakota Conservation Digest.*

FINANCIAL STATEMENT

N. C. DIVISION OF GAME AND INLAND FISHERIES

Period July 1, 1945 to June 30, 1946

EXPENDITURES	
Fisheries Administration	$ 8,866.89
Fish Hatcheries Operations (5)	40,391.24
Game Administration	19,881.99
Law Enforcement	225,980.93
Game Management	8,196.83
Game Farm Operations (Fayetteville)	4,055.21
Management Areas and Refuges	39,220.33
Education and Training	8,163.07
Federal Aid in Wildlife Restoration	31,389.06
Miscellaneous Accounts	29,763.18
Motor Boat Operation	
Equipment—Boats	
Workmen's Compensation	
Contribution Retirement System	
Emergency Salaries	
Total Expenditures	$415,908.73

RECEIPTS	
Sale of Anglers' Licenses	$144,413.00
Sale of Hunting Licenses	355,955.18
Transfer from preceding year	140,419.83
Federal Cooperation	18,692.18
Receipts from Management Areas	130.00
Sale of Federal Aid Equipment	234.13
Miscellaneous Receipts	399.00
Total Receipts	$660,243.32
Credit Balance	244,334.59
Less: Reserve for acquisition of lands and waters	48,917.00
*Amount to be carried forward for use in 1946-47	$195,417.59

*This is not a surplus fund. This money is carried forward and is made a part of the 1946-47 budget and is used during July and August and often September for operational costs. During these months receipts normally are small. The monthly cost of operation for the Division of Game and Inland Fisheries is now approximately $60,000. These costs have increased rapidly with our expanding program.

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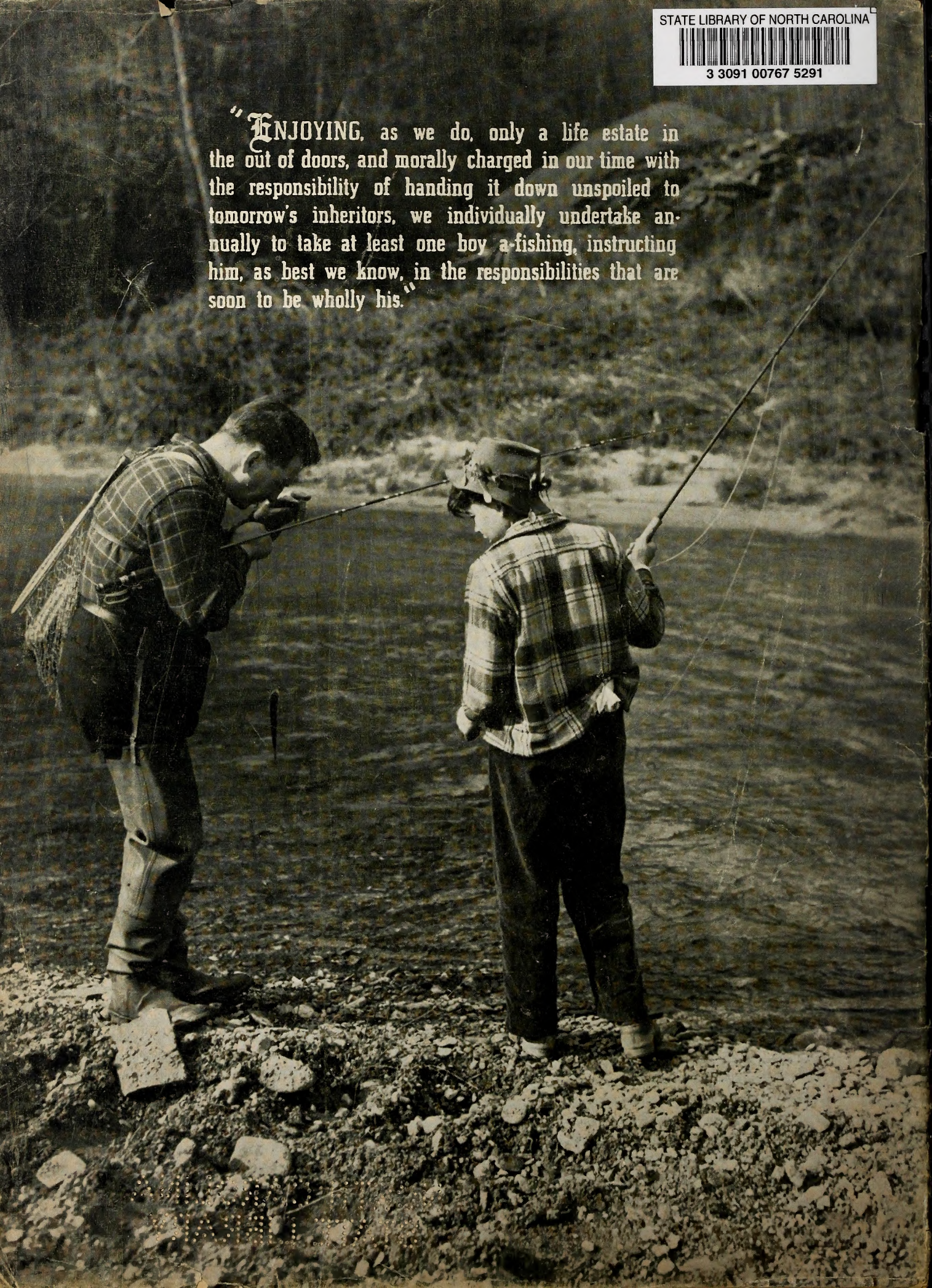
"ENJOYING, as we do, only a life estate in the out of doors, and morally charged in our time with the responsibility of handing it down unspoiled to tomorrow's inheritors, we individually undertake annually to take at least one boy a-fishing, instructing him, as best we know, in the responsibilities that are soon to be wholly his."